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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,120	04/27/2006	Detlef Michelsson	RECP:113US	8891

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EXAMINER	
SENT, PAPE A	

ART UNIT	PAPER NUMBER
4135	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,120	MICHELSSON, DETLEF	
	Examiner	Art Unit	
	PAPE SENE	4135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 May 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/10/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Objections

1. Claim **7** is objected to because of the following informalities: the phrase "is selected independent of the radial position" should be "is selected independent of a radial position". Claim **11** is objected to because of the following informalities: the phrase "one parameter defines the radial position" should be "one parameter defines a radial position". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims **4, 5 and 15** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically regarding claim **4**, the phrase "the distance from a center point of the wafer" is indefinite since it is not clear whether it's according to the plane of the surface wafer or any other plane. For purposes of examination, the assumed meaning is "the distance from a center point of the wafer to a point on the wafer surface".

Regarding claim **5 and 15**, the phrase "can be" renders the claim indefinite because the claim includes elements not actually disclosed (those encompassed by "can be"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **1-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Futatsuya (U.S. Patent No. 7,047,516) in view of Wihl (U.S. Patent Application No. 2002/0054702) in further view of Nakamura (U.S. Patent Application No. 2004/0027618).

1. Referring to claim **1**, Futatsuya discloses a method for determining (fig. 8) defects (mask pattern, wherein it does not have a desired form and is the object to be corrected, Column 7, Ln. 54-67; Col. 2, Ln. 45-65) in recorded (Col. 7, Ln. 56-65) mask pattern images (Col. 1, Lines 52-55) by the steps, which comprise: recording an image of one reference mask pattern (target object, Col. 5, Ln. 38-42; Col. 1, Ln. 52-55; Column 8, Ln. 13-20; Column 2, Ln. 45-55), determining and recording on a computer (Computer, Col. 7, Ln 56-65) a radial distribution (Col. 6, Ln. 15-67) of values (light intensity values, Col. 3, Ln. 53-64) measured on the one reference mask pattern (target object) as a radial homogeneity

function (Col. 6, Ln. 15-67), and changing a radially dependent sensitivity profile (intensity values, Col. 6, Ln. 15-67) while taking into account the radial homogeneity function (Col. 6, Ln. 15-67) of the one reference mask pattern (target object, which has the desired mask pattern form) by varying one parameter (weight coefficient W(n)) of the sensitivity profile (light intensity values, Col. 7, Ln. 7), a learned sensitivity profile (light intensity values) being determined by comparison with the radial homogeneity function (Col. 6, Ln. 15-67).

Futatsuya does not disclose a learned sensitivity profile (light intensity values) being determined visually by comparison with the radial homogeneity function, and does not either disclose determining defects specifically in wafers.

Wihl teaches a defect detection apparatus, which further comprises ([0090]-[0095]) a learned sensitivity profile ([0095], digitized image) being determined visually (displayed on display 22) by comparison ([0093], comparison between the die and a simulated image generated by database is done) with the database image data, and further teaches ([0036]-[0039]) that the same system (10, fig. 1) used for inspecting defects in masks, is used to also inspect defects to inspect mask patterns [0036].

Futatsuya does not disclose determining and representing on a user interface a radial distribution of values measured.

Nakamura teaches an image defect detecting method, which further comprises determining and representing on a user interface measured values (fig. 4).

It would have been obvious to a person of ordinary skill at the time the invention was made to modify the disclosure of Futatsuya to include the teaching of Wihl and the teaching of Nakamura to further comprise a method for determining defects in recorded wafer images by the steps, which comprise: recording an image of at least one reference wafer, determining and representing on a user interface a radial distribution of values measured on the at least one reference wafer as a radial homogeneity function, and changing a radially dependent sensitivity profile while taking into account the radial homogeneity function of the at least one reference wafer by varying at least one parameter of the sensitivity profile, a learned sensitivity profile being determined visually by comparison with the radial homogeneity function.

Wihl provides motivation in ([0090]-[0095]); it would have been obvious to combine Futatsuya disclosure with Wihl teaching for the purpose of enabling the operator to compare the displayed image to the database image.

Nakamura provides motivation in ([0153]-[0171]); it would have been obvious to combine Nakamura teaching with Futatsuya disclosure and Wihl teaching for the purpose of making easier on the user to determine the defect image and make necessary adjustments.

2. Referring to claim **2**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Futatsuya further discloses that the determination of defects in said recorded mask pattern images is carried out on at least one other mask pattern by comparison between the learned sensitivity profile of the at least one reference mask pattern with the measured radial distribution of the homogeneity function of the at least one other mask pattern, a defect being determined from the comparison (Col. 8, Ln. 43-50; when the object to be corrected does not have the desired form) of the measured radial distribution of the homogeneity function with the learned sensitivity profile, and Wihl further teaches a wafer.

3. Referring to claim **3**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 2, and Futatsuya further discloses that the defect is determined by measuring the radial distribution of the homogeneity function falling below the learned sensitivity profile and marking a graphic representation of the at least one other mask pattern ((Col. 5, Ln. 47-60)when the measured light intensity values are different from the desired values), and Wihl further teaches a wafer.

4. Referring to claim **4**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Futatsuya further discloses that the learned sensitivity profile (light intensity values for desired target object) depends on the distance from a center point of the mask pattern to a position on the mask pattern (Col. 6, Ln. 41-67), and Wihl further teaches a wafer.

5. Referring to claim **5**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Futatsuya further discloses that several different profile forms (proximity effect correction Col. 4, Ln. 54-67, optimal moving amounts of sides Col.5, Ln. 1-12) are selected to determine the learned sensitivity profile.

6. Referring to claim **6**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 5, and Futatsuya further discloses that three different profile forms (proximity effect correction Col. 4, Ln. 54-67, optimal moving amounts of sides Col. 5, Ln. 1-12, and weight coefficient) are selected to determine the learned sensitivity profile.

7. Referring to claim **7**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Futatsuya further discloses that a first profile form is selected independent (proximity effect correction, Col. 4, Ln. 54-67) of a radial position on the mask pattern, and Wihl further teaches a wafer.

8. Referring to claim **8**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 7, and Futatsuya further discloses that a second profile form (optimal moving amounts

of sides, Column 5, Ln. 1-12) is selected and comprises a first and a second section (sides a and b, fig. 5A), one of which (fig. 5A, side a to be corrected) can be varied in slope.

9. Referring to claim **9**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 8, and Futatsuya further discloses that a third profile form (optimal moving amounts of sides, Column 5, Ln. 1-12) is provided having a first, second and third sections (sides a, b and c, fig. 5A) of which one (fig. 5A, side a to be corrected) can be varied in slope.

10. Referring to claim **10**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Futatsuya further discloses that at least one parameter (weight coefficient; Col. 6, Ln. 41-67) is changed so as to adapt the sensitivity profile (light intensity values) to the radial homogeneity function of a mask pattern, and Wihl further teaches a wafer.

11. Referring to claim **11**, Futatsuya and Wihl disclose a method for determining defects in recorded wafer images as defined in claim 10, and Futatsuya further discloses that the one parameter defines a radial position of a transition between two sections (undesired target object to desired target object) of the sensitivity profile (light intensity values, Col. 6, Ln. 39-50) differing in slope.

12. Referring to claim **12**, Futatsuya and Wihl disclose a method for determining defects in recorded wafer images as defined in claim 10, and Futatsuya further discloses that the sensitivity profile comprises at least three levels of settings (A(n), B(n), C(n)) and a parameter (x) defines the level of the sensitivity profile (Col. 6, Ln. 31-50).

13. Referring to claim **13,** Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 12, and Nakamura further discloses that the setting of the level can be changed by means of a slider ([0169] and [0170]).

14. Referring to claim **14,** Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Wihl further discloses that several learned sensitivity profiles (outputs, [0095]) are combined [0095].

15. Referring to claim **15**, Futatsuya, Wihl and Nakamura disclose a method for determining defects in recorded wafer images as defined in claim 1, and Wihl further discloses that a learned sensitivity profile (image from database) is replaced by a relearned sensitivity profile (image of the second die) at any time [0020], [0021] and [0038].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAPE SENE whose telephone number is (571)270-5284. The examiner can normally be reached on 5/4/9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Brewster can be reached on (571)272-1854. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PAPE SENE/
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